REMARKS

Claim 8 is objected to as being indefinite for failing to particularly point out and distinctly claim the subject matter which the Applicant regards as the invention. Accordingly , Claim 8 has been amended to correct a typographical error. Claims 19-21 have been amended to correct a typographical error relating to dependency.

Claims 1, 5, 7, 14 and 24 stand rejected under 35 U.S.C. 102(e) as being anticipated by Sugitatsu et al. (2004/0062505).

Applicants respectfully traverse the rejection. Anticipation requires the presence in a single prior art disclosure of all the elements of a claimed invention arranged as in the claim. *Connell v. Sears, Roebuck & Co.* 722 F.2d at 1548 (Fed. Cir. 1983). Sugitatsu et al. does not disclose a 2-dimensional photonic crystal sensor apparatus. The Examiner identifies the "sensor (e.g. 10)". However, this is clearly not a sensor and is identified by Sugitatsu et al. as an optical active device. Sugitatsu et al. nowhere discloses the operation of a sensor. Sugitatsu et al. further states "the operation of laser oscillation when optical active device 10 formed in this manner is used as a semiconductor laser oscillator is explained below" (page 4, paragraph 0052). A semiconductor laser oscillator is not a sensor and therefore each and every element of Claims 1 and 24 are not taught in a single reference. Hence, Claims 1 and 24 are allowable over Sugitatsu et al. Claims 5, 7 and 14 depend from Claim 1 and are allowable for at least the same reasons as Claim 1.

Claims 1, 4, 7, 22 and 23 stand rejected under 35 U.S.C. 102(e) as being anticipated by Shirane et al. (6,937,781).

Applicants respectfully traverse the rejection. Anticipation requires the presence in a single prior art disclosure of all the elements of a claimed invention arranged as in

the claim. *Connell v. Sears, Roebuck & Co.* 722 F.2d at 1548 (Fed. Cir. 1983). Shirane does not disclose a 2-dimensional photonic crystal sensor apparatus and does not disclose a "defect hole" as recited in Claim 1. Shirane discloses an optical switch having photonic crystal structure. A switch is not a sensor. Shirane discloses a line-defect which is not a "defect hole" as recited in Claim 1 and nowhere discloses a "sensor" as recited in Claim 1. Hence, Claim 1 is allowable over Shirane and Claims 4 and 7 which depend from Claim 1 are allowable for at least the same reasons as Claim 1. Claim 23 recites in part a "three dimensional photonic crystal sensor". Shirane nowhere discloses a"three dimensional photonic crystal" nor a "three dimensional photonic crystal sensor". Hence, Claim 22 is allowable over Shirane and Claim 23 which depends from Claim 22 is allowable for at least the same reasons as Claim 22.

Claims 1, 2, 3 and 6 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miller et al. (2004/0027646) in view of Romagnoli et al. (2005/0175304).

Applicants respectfully traverse the rejection. The Examiner has failed to make a prima facie case of obviousness. To establish a prima facie case of obviousness three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must be found in the prior art, and not based on the applicant's disclosure. *In Re Vaeck, 947* F.2d 488, (Fed. Cir. 1991).

Miller et al. deals with providing "photonic crystals whose properties can be reversibly tuned or switched and devices for controlling propagation of electromagnetic radiation that incorporate such crystals" (emphasis added) (page 2, paragraph 11). Hence, Miller et al. are concerned with providing "photonic crystals with properties that can be reversibly tuned or switched as well as electromagnetic propagation and routing devices that exploit these crystals" (emphasis added) (page 3, paragraph 23). Romagnoli et al. deals with a method for guiding an electromagnetic radiation, in particular in an integrated optical device. Neither Romagnoli et al. nor Miller et al. teach an apparatus and method comprising a "photonic crystal sensor" apparatus as recited in Claim 1 . Hence, the Examiner has failed to make a prima facie case of obviousness because there is no motivation or suggestion to combine the cited two references because they do not disclose, teach or suggest a "photonic crystal sensor" as recited in Claim 1. Additionally, the combination of references does not teach or suggest all the claim limitations. Therefore, Claim 1 is allowable over Miller et al. in view of Romagnoli et al. Claims 2, 3 and 6 depend from Claim 1 and are allowable for at least the same reasons as Claim 1.

Claims 1 and 13-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Soljacic et al. (2004/0033009) in view of Sugitatsu et al. (2004/0062505), in further view of Miller et al. (2004/002646). As noted above neither Miller et al. nor Sugitatsu et al . are relevant to a "photonic crystal sensor" apparatus as recited in Claims 1 and 15 as they do not teach or suggest either individually or in combination all the limitations of Claims 1 and 15. The addition of Soljacic et al. which deals with optimal bistable switching in non-linear photonic crystals does nothing to change the argument. Soljacic et al. do not disclose, teach or suggest a "photonic crystal sensor" apparatus as recited in

Claim 1 and 15. Hence, Claims 1 and 15 are allowable over Soljacic et al. (2004/0033009) in view of Sugitatsu et al. (2004/0062505), in further view of Miller et al. (2004/002646). Claims 13-14 depend from Claim 1 and are allowable for at least the same reasons as Claim 1. Claims 16-17 depend from Claim 15 and are allowable for at least the same reasons as Claim 15.

Claims 1, 9-12 and 18-21 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Platzman et al. (6,697,542).

Applicants respectfully traverse the rejection. The Examiner has failed to make a prima facie case of obviousness. To establish a prima facie case of obviousness three criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and reasonable expectation of success must be found in the prior art, and not based on the applicant's disclosure. *In Re Vaeck, 947* F.2d 488, (Fed. Cir. 1991).

The Examiner has not clearly characterized Platzman et al. Platzman et al. deals with integrated optical switches using nonlinear optical media and there is not a teaching, disclosure or suggestion by Platzman et al. of an apparatus and method comprising a 2 D sensor apparatus. The invention taught, disclosed or suggested by Platzman et al. is an integrated optical switch. The Examiner has not provided any reasoning that would lead one of ordinary skill in the art at the time to modify the integrated optical switch of

Platzman et al. to make a "photonic crystal sensor" apparatus as recited in Claims 1 and 18. Additionally, Platzman et al. do not teach or suggest all the claim limitations of Claims 1 and 18. There is no suggestion or teaching of a "photonic crystal sensor" apparatus. Therefore Claims 1 and 18 are allowable over Platzman et al. Claims 9-12 depend from Claim 1 and are allowable for at least the same reasons as Claim 1. Claims 19-21 depend from Claim 18 and are allowable for at least the same reasons as Claim 18.

Claims 1, 9 and 24 are provisionally rejected under the judicially created doctrine of obviousness double patenting as being unpatentable over claims 1 and 8 of copending Application No. 11/078,785 in view of Miller et al. (2004/0027646). Applicants note that the cited doctrine does not apply to the instant Application as it is the parent Application of Application No. 11/078,785. Hence, the Examiner's objection is moot.

Therefore, Claims 1-24 are allowable and allowance is respectfully requested. Should the Examiner wish to discuss any aspect of the application he is invited to telephone the undersigned at (650) 485-5904.

Respectfully submitted,

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